RECRA LabNet

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Virtual Laboratories Everywhere

0051722

JUL 1999 RECEIVED Data Log In

SEP 1999 RECEIVED EDMC

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-063
RFW# : 9906L294
SAG# : H0452
SAF#: B99-063

W.O. # : 10985-001-001-9999-00
Date Received: 06-24-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blank for Chromium VI was within method criteria.

6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.

8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7-6-99
Date

njp\i06-294

WET CHEMISTRY
METHODS GLOSSARY FOR ANALYSIS OF SOIL/SOLID SAMPLES

	ASTM	SW846	OTHER
%Ash	__ D2216-80		
%Moisture	__ D2216-80		__ ILMO4.0 (e)
%Solids			✓ ILMO4.0 (e)
%Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Corrosivity __by coupon __by pH		__ 1110 (mod)__ 9045	
Cyanide, Total		__ 9010	__ ILMO4.0 (e)
Cyanide, Reactive		__ Sec 7.3	
Density			__ b
Halides, Extractable Organic			__ EPA 600/4/84-008 (mod)
Halides, Total			__ EPA 600/4/84-008 (mod)
EP-Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Carbon, Total Organic (by LOI)			__ c
Oil and Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87 (mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1 (mod)
pH, Soil		__ 9045B	
Sulfide, Reactive		__ Sec 7.3	
Specific Gravity	__ D1429-76C		
Sulfur, Total		__ 9056	
TCLP		__ 1311	
TCLV		__ 1311	
Synthetic Precipitation Leach		__ 1312	
Chlorine, Total		__ 9056	
Paint Filter		__ 9095	

Other: Chromium VI Method: SW3060A/7196A

Recra LabNet Philadelphia

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 06/29/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VR10	% Solids	97.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/29/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI050-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 06/29/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0VR10	Soluble Chromium VI	4.3	0.41u	4.1	108.6	1.0
		Insoluble Chromium VI	1130	0.41u	1190	95.1	100
BLANK10	99LVI050-MB1	Soluble Chromium VI	4.3	0.40u	4.0	108.6	1.0
		Insoluble Chromium VI	1100	0.40u	1160	94.5	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 06/29/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0VR10	Chromium VI	0.41u	0.41u	NC	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-063

DATE RECEIVED: 06/24/99 RFW LOT # :9906L294

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VR10						
% SOLIDS	001	S	99L%S091	06/21/99	06/28/99	06/29/99
CHROMIUM VI	001	S	99LVI050	06/21/99	06/28/99	06/28/99
CHROMIUM VI	001 REP	S	99LVI050	06/21/99	06/28/99	06/28/99
CHROMIUM VI	001 MS	S	99LVI050	06/21/99	06/28/99	06/28/99
CHROMIUM VI	001 MSD	S	99LVI050	06/21/99	06/28/99	06/28/99
LAB QC:						
CHROMIUM VI	MB1	S	99LVI050	N/A	06/28/99	06/28/99
CHROMIUM VI	MB1 BS	S	99LVI050	N/A	06/28/99	06/28/99
CHROMIUM VI	MB1 BSD	S	99LVI050	N/A	06/28/99	06/28/99

RECRA LabNet Use Only: 9906L294

Custody Transfer Record/Lab Work Request

Page 1 of 1

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TRU-Hanford B99-063

Est. Final Proj. Sampling Date:

Project #: 10985-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 15 day

Date Rec'd: 6-24-99 Date Due: 7/9/99

Account #:

		VOA	BNA	Pest/PCB	Herb					Metal	CN						
Refrigerator #				5						5		5					
#/Type Container	Liquid			1g													
	Solid									1g		1g					
Volume	Liquid																
	Solid			60						60		60					
Preservatives																	

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

RECRA LabNet Use Only

MATRIX CODES:
- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- L - EP/TCLP Leachate
- WI - Wipe
- X - Other
- F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB (OPCB)	Herb					Metal (Cr Pb As)	CN	IRG
001	B0VR10	X	X	S	6-21-99	1100			✓						✓		✓

Special Instructions:

saf # B99-063

COMPOSITE WASTE

ORIGINAL REWRITTEN

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	TMoney	6/24/99	0930				

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4019644300
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 8.7 °C

0009

Bechtel Hanford Inc. (294)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-063-005 Page 1 of 1

Collector: Mike Stankovich	Company Contact: Mike Stankovich; Telephone No. (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code
Project Designation: 100 H Area - Other Solid	Sampling Location: 116-H-7	SAF No.: B99-063	Data Turnaround: 21 D
Ice Chest No.: 1A2 METAL DRUM	Field Logbook No.: EL-1500	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA 1/B 62299	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA R116H7 2600	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage
Cool 4 degree C

Preservation	None		Cool 4 C	Cool 4C	None	None	None
Type of Container	P	aG	aG	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	1	1
Volume	20mL	60mL	60mL	60mL	60mL	60mL	~~250~~ 1000mL 6-21-99
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Isotopic Uranium (Uranium-238); Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Item (1)	Chromium Hex	PCBs	Isotopic U/Pu/Am	Ni-63; Sr	Item (2)		
B0VR10	Other Solid	6-21-99	1100	~~✓~~ MS 6-21-99	✓	✓	✓	~~✓~~	~~✓~~ SJS 62299	~~✓~~		B0VFC6

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
M. Stankovich	6-21-99 1500	1/B	
REF 1 B	62399 800	SJ GALE	62399 800
SJ GALE	62399 800	FED EX.	
[illegible]		[illegible] for T Murray	

SPECIAL INSTRUCTIONS
R116H7 2F00 (Lab) R116H7 2600 (Samplers)
(1) ICP Metals - 6010A (Supertrace) {Chromium, Lead, Arsenic}; ~~Mercury - 7471 - (CV)~~
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

COLLECTOR UNAVAILABLE TO SIGN COC

1/B = 3°C

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title 6/24/99 0930	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

RECRA ENVIRONMENTAL INC.
Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-063
RFW# : 9906L294
SDG/SAF# : H0452/B99-063

W.O.# : 10985-001-001-9999-00
Date Received: 06-24-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value). Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

11. The duplicate analyses for Chromium and Lead were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Maureen L. Doughty

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

7/9/99
Date

mld/m06-294

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 9906L294

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050A __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B	__200.7			__99
Antimony	__6010B __7041 [5]	__200.7 __204.2			__99
Arsenic	✓6010B __7060A [5]	__200.7 __206.2	__3113B		__99
Barium	__6010B	__200.7			__99
Beryllium	__6010B	__200.7			__99
Bismuth	__6010B [1]	__200.7 [1]		__1620	__99
Boron	__6010B	__200.7			__99
Cadmium	__6010B __7131A [5]	__200.7 __213.2			__99
Calcium	__6010B	__200.7			__99
Chromium	✓6010B __7191 [5]	__200.7 __218.2			__SS17
Cobalt	__6010B	__200.7			__99
Copper	__6010B __7211 [5]	__200.7 __220.2			__99
Iron	__6010B	__200.7			__99
Lead	✓6010B __7421 [5]	__200.7 __239.2	__3113B		__99
Lithium	__6010B __7430 [4]	__200.7		__1620	__99
Magnesium	__6010B	__200.7			__99
Manganese	__6010B	__200.7			__99
Mercury	__7470A [3] __7471A [3]	__245.1 [2] __245.5 [2]			__99
Molybdenum	__6010B	__200.7			__99
Nickel	__6010B	__200.7			__99
Potassium	__6010B __7610 [4]	__200.7 __258.1 [4]			__99
Rare Earths	__6010B [1]	__200.7 [1]		__1620	__99
Selenium	__6010B __7740 [5]	__200.7 __270.2	__3113B		__99
Silicon	__6010B [1]	__200.7		__1620	__99
Silica	__6010B	__200.7		__1620	__99
Silver	__6010B __7761 [5]	__200.7 __272.2			__99
Sodium	__6010B __7770 [4]	__200.7 __273.1 [4]			__99
Strontium	__6010B	__200.7			__99
Thallium	__6010B __7841 [5]	__200.7 __279.2 __200.9			__99
Tin	__6010B	__200.7			__99
Titanium	__6010B	__200.7			__99
Uranium	__6010B [1]	__200.7 [1]		__1620	__99
Vanadium	__6010B	__200.7			__99
Zinc	__6010B	__200.7			__99
Zirconium	__6010B [1]	__200.7 [1]		__1620	__99

Other:_____ **Method:**_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 07/09/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VR10	Arsenic, Total	6.2	MG/KG	0.16	1.0
		Chromium, Total	17.5	MG/KG	0.04	1.0
		Lead, Total	33.5	MG/KG	0.20	1.0

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/09/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0444-MB1	Arsenic, Total	0.23 u	MG/KG	0.23	1.0
		Chromium, Total	0.06	MG/KG	0.06	1.0
		Lead, Total	0.29 u	MG/KG	0.29	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 07/09/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B0VR10	Arsenic, Total	170	6.2	181	90.5	1.0
		Chromium, Total	31.2	17.5	18.1	75.7	1.0
		Lead, Total	77.8	33.5	45.3	97.8	1.0

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 07/09/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B0VR10	Arsenic, Total	6.2	5.2	17.5	1.0
		Chromium, Total	17.5	31.6	57.4	1.0
		Lead, Total	33.5	72.6	73.7	1.0

Recra LabNet - Lionville

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/09/99

CLIENT: TNU-HANFORD B99-063 RECRA LOT #: 9906L294

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	99L0444-LC1	Arsenic, LCS	958	1000	MG/KG	95.8
		Chromium, LCS	49.4	50.0	MG/KG	98.8
		Lead, LCS	244	250	MG/KG	97.6

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-063

DATE RECEIVED: 06/24/99 RFW LOT # :9906L294

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VR10						
ARSENIC, TOTAL	001	S	99L0444	06/21/99	06/30/99	07/02/99
ARSENIC, TOTAL	001 REP	S	99L0444	06/21/99	06/30/99	07/02/99
ARSENIC, TOTAL	001 MS	S	99L0444	06/21/99	06/30/99	07/02/99
CHROMIUM, TOTAL	001	S	99L0444	06/21/99	06/30/99	07/02/99
CHROMIUM, TOTAL	001 REP	S	99L0444	06/21/99	06/30/99	07/02/99
CHROMIUM, TOTAL	001 MS	S	99L0444	06/21/99	06/30/99	07/02/99
LEAD, TOTAL	001	S	99L0444	06/21/99	06/30/99	07/02/99
LEAD, TOTAL	001 REP	S	99L0444	06/21/99	06/30/99	07/02/99
LEAD, TOTAL	001 MS	S	99L0444	06/21/99	06/30/99	07/02/99
LAB QC:						
ARSENIC LABORATORY	LC1 BS	S	99L0444	N/A	06/30/99	07/02/99
ARSENIC, TOTAL	MB1	S	99L0444	N/A	06/30/99	07/02/99
CHROMIUM LABORATORY	LC1 BS	S	99L0444	N/A	06/30/99	07/02/99
CHROMIUM, TOTAL	MB1	S	99L0444	N/A	06/30/99	07/02/99
LEAD LABORATORY	LC1 BS	S	99L0444	N/A	06/30/99	07/02/99
LEAD, TOTAL	MB1	S	99L0444	N/A	06/30/99	07/02/99

RECRA LabNet Use Only

9906L294

Custody Transfer Record/Lab Work Request

Page 1 of 1

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

RECR LabNe

Client: TRU-Hanford B99-003

Est. Final Proj. Sampling Date:

Project #: 10485-001-001-9999-00

Project Contact/Phone #:

RECRA Project Manager: OJ

QC: spec Del: std TAT: 15 day

Date Rec'd: 6-24-99 Date Due: 7/9/99

Account #:

Refrigerator #				5					5		5								
#/Type Container	Liquid			1g															
	Solid			2					1g		1g								
Volume	Liquid																		
	Solid			60					60		60								
Preservatives																			
ANALYSES REQUESTED →		ORGANIC							INORG										
		VOA	BNA	Pest/PCB	Herb				Metal	CN									
									RECRA LabNet Use Only										
				OPCB ✓					Dr PD AS ✓		1046 ✓								

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	B00R10	X	X	S	6-24-99	1100

Special Instructions:

saf # B99-003

COMPOSITE WASTE

ORIGINAL REWRITTEN

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # 401946443 00
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 8.7 °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
Fed Ex	TMoney	6/24/99	0930

Relinquished by	Received by	Date	Time

Bechtel Hanford Inc.	290	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-063-005	Page 1 of 1

Collector Mike Stankovich	Company Contact Mike Stankovich	Telephone No. (509) 531-7620	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 21 D
Project Designation 100 H Area - Other Solid	Sampling Location 116-H-7		SAF No. B99-063	
Ice Chest No. 1A2 METAL DRUM	Field Logbook No. EL-1500		Method of Shipment FED EX	
Shipped To ~~TMA~~/RECRA S/B 62299	Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A	
			COA R116H72600	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage
Cool 4 degree C

Preservation	None		Cool 4 C	Cool 4C	None	None	None
Type of Container	P	aG	aG	aG	aG	aG	G/P
No. of Container(s)	1	1	1	1	1	1	1
Volume	20mL	60mL	60mL	60mL	60mL	60mL	1000 ~~750~~mL 6-21-99
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Isotopic Uranium (Uranium-238); Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time								
B0VR10	Other Solid	6-21-99	1100	~~✓~~ [initials] 6-21-99	✓	✓	✓	~~✓~~ S/B 62299	~~✓~~	~~✓~~	B0VFCC

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
[signature] STANKOVICH	6-21-99 1500	H/B	
Relinquished By REF 1-B 62399 800	Date/Time	Received By SJGALE [signature] 62399 800	Date/Time
Relinquished By SJGALE [signature] 62399 800	Date/Time	Received By FED EX.	Date/Time
Relinquished By [signature]	Date/Time	Received By [signature] for T Murray	Date/Time

SPECIAL INSTRUCTIONS
R116H7 2F00 (Lab) R116H7 2600 (Samplers)
(1) ICP Metals - 6010A (Supertrace) {Chromium, Lead}; ~~Mercury - 7471 - (CV)~~ Arsenic
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

COLLECTOR UNAVAILABLE TO SIGN COC

H/B = 3°C

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
			6/24/99 0930

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

012

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

JUL 1999 RECEIVED Data Log In

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-063
RFW#: 9906L294
SDG/SAF#: H0452/B99-063

W.O.#: 10985-001-001-9999-00
Date Received: 06-24-99

PCB

One (1) soil sample was collected on 06-21-99.

The sample and its associated QC samples were extracted on 06-25-99 and analyzed based on SW846, 3rd Edition procedures on 06-30-99. The extraction procedure was based on method 3550 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.
2. The required holding times for extraction and analysis were met.
3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. The matrix spike recoveries were within acceptance criteria.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. The sample could not be concentrated to method specified final volume of 10 mL; consequently, it was concentrated to 40 mL and reported.

for [signature]
J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

07-14-99
Date

som\group\data\pest\tnu06294.doc

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

I = Interference.

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP = Indicates Spiked Compound.

GLOSSARY OF PESTICIDE/PCB DATA

P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".

D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C = This flag applies to a compound that has been confirmed by GC/MS.

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 07/07/99 13:35

RFW Batch Number: 9906L294 Client: TNU-HANFORD B99-063 Work Order: 10985001001 Page: 1

	Cust ID:	B0VR10	B0VR10	B0VR10	PBLKMV	PBLKMV BS
Sample Information	RFW#:	001	001 MS	001 MSD	99LE0756-MB1	99LE0756-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		D %	D %	D %	110 %	118 %
Decachlorobiphenyl		D %	D %	D %	100 %	102 %
Aroclor-1016		410 U	410 U	410 U	33 U	33 U
Aroclor-1221		820 U	820 U	820 U	67 U	67 U
Aroclor-1232		410 U	410 U	410 U	33 U	33 U
Aroclor-1242		410 U	410 U	410 U	33 U	33 U
Aroclor-1248		410 U	410 U	410 U	33 U	33 U
Aroclor-1254		410 U	57 %	68 %	33 U	99 %
Aroclor-1260		410 U	410 U	410 U	33 U	33 U

07-08-99

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Recra LabNet - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B99-063

DATE RECEIVED: 06/24/99 RFW LOT # :9906L294

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B0VR10	001	S	99LE0756	06/21/99	06/25/99	06/30/99
B0VR10	001 MS	S	99LE0756	06/21/99	06/25/99	06/30/99
B0VR10	001 MSD	S	99LE0756	06/21/99	06/25/99	06/30/99
LAB QC:						
PBLKMV	MB1	S	99LE0756	N/A	06/25/99	06/30/99
PBLKMV	MB1 BS	S	99LE0756	N/A	06/25/99	06/30/99

gw 07-28-99

RECRA LabNet Use Only
990602294

Custody Transfer Record/Lab Work Request

RECRA LabNet

ALL FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TRU-Hanford B99-063
Est. Final Proj. Sampling Date
Project # 10985-001-001-9999-00
Project Contact/Phone #
RECRA Project Manager DJ
QC spec Del std TAT 15 day
Date Rec'd 6-24-99 Date Due 7/9/99
Account #

		VOA	BNA	Pest/PCB	Herb				Metal	CN						
Refrigerator #				5					5		5					
#/Type Container	Liquid			1g												
	Solid								1g		1g					
Volume	Liquid															
	Solid			60					60		60					
Preservatives																

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

RECRA LabNet Use Only

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB (OPCB)	Herb				Metal (Cr Pb As)	CN	ICRC (?)
001	BOURIO	X	X	S	6-21-99	1100			✓					✓		✓

Special Instructions:
saf # B99-063

COMPOSITE WASTE

ORIGINAL REWRITTEN

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 4019644300
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 8.7 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fred Ed	T Murray	6/24/99	0930				

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:

Bechtel Hanford Inc.	29	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-063-005	Page 1 of 10

Collector: Mike Stankovich	Company Contact: Mike Stankovich; Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code; Data Turnaround: 21 D
Project Designation: 100 H Area - Other Solid	Sampling Location: 116-H-7	SAF No.: B99-063	
Ice Chest No.: 1A2 METAL DRUM	Field Logbook No.: EL-1500	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA SJS 62299	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: R116H72600	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage
Cool 4 degree C

		Preservation		None		Cool 4 C	Cool 4C	None	None	None		
		Type of Container		P	aG	aG	aG	aG	aG	G/P		
		No. of Container(s)		1	1	1	1	1	1	1		
		Volume		20mL	60mL	60mL	60mL	60mL	60mL	1000 ~~250~~mL 6-21-99		
SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions	Chromium Hex - 7196	PCBs - 8082	Isotopic Uranium {Uranium-238}; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	See item (2) in Special Instructions.		
Sample No.	Matrix *	Sample Date	Sample Time									
B0VR10	Other Solid	6-21-99	1100	~~✓~~ MS 6-21-99	✓	✓	✓	~~✓~~ SJS 62299	~~✓~~	~~✓~~		B0VFC6

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Stankovich M Stankovich	Date/Time: 6-21-99 1500	Received By: #1B	Date/Time
Relinquished By: REF 1B	Date/Time: 62399 800	Received By: SJGALE SJGale	Date/Time: 62399 800
Relinquished By: SJGALE SJGale	Date/Time: 62399 800	Received By: FED EX	Date/Time
Relinquished By: Fedex	Date/Time	Received By: [signature] for T Murray	Date/Time

SPECIAL INSTRUCTIONS
R116H7 2F00 (Lab) R116H7 2600 (Samplers)
(1) ICP Metals - 6010A (Supertrace) {Chromium, Lead}; Arsenic ~~Mercury - 7471 - (CV)~~
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

COLLECTOR UNAVAILABLE TO SIGN COC

#1B = 3°C

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time: 6/24/99 0930
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Recra.LabNet Lionville, Lab.

SAMPLE EXTRACTION RECORD

Sheet no.: 1

Extract. Date: 06/25/99 Extraction Batch No: 99LE0756 Analyst: MC Method: SONC

Test: OPCB Cleanup Date: 06/28/99 Analyst: AM Client: TNU-HANFORD B99-063

LIMS Report Date: 07/07/99 Solvent: ACE/DCM/HEX Adsorbent: ACID

Sample No:	Client Name Client ID	pH	Initial WT/VOL	Surr. Mult.	Spike Mult.	Final VOL	Final VOL	Split Mult.	GPC Y/N	% Solids	C/D FACTOR
9906L272-	TNU-HANFORD B99-063										
001	B0VLK3		30.0	1.0		40		1.0	N	96.25	1385.3
001 -S	B0VLK3		30.0	1.0	1.0	40		1.0	N	96.25	1385.3
001 -T	B0VLK3		30.0	1.0	1.0	40		1.0	N	96.25	1385.3
9906L281-	WSRC HAZ 99160										
001	99160-3 GRAY		5.0	1.0		10		1.0	N	95.29	2098.9
001 -R	99160-3 GRAY		5.0	1.0		10		1.0	N	95.29	2098.9
001 -S	99160-3 GRAY		5.0	1.0	1.0	10		1.0	N	95.29	2098.9
002	99160-2 GREEN		5.0	1.0		10		1.0	N	85.89	2328.6
003	99160-1 Y		5.0	1.0		10		1.0	N	91.95	2175.1
9906L294-	TNU-HANFORD B99-063										
001	B0VR10		10.0	1.0		40		1.0	N	97.66	4095.8
001 -S	B0VR10		10.0	1.0	1.0	40		1.0	N	97.66	4095.8
001 -T	B0VR10		10.0	1.0	1.0	40		1.0	N	97.66	4095.8
9906L297-	WSRC HAZ 99160										
001	99160-5 BLUE		5.0	1.0		10		1.0	N	97.98	2041.2
002	99160-4 RED		5.0	1.0		10		1.0	N	97.63	2048.6
9906L301-	TNU-HANFORD B99-041										
001	B0VR11		30.0	1.0		10		1.0	N	94.98	351.0
002	B0VR12		30.0	1.0		10		1.0	N	97.56	341.7
002 -S	B0VR12		30.0	1.0	1.0	10		1.0	N	97.56	341.7
002 -T	B0VR12		30.0	1.0	1.0	10		1.0	N	97.56	341.7
99LE0756-MB1	PBLKMV		30.0	1.0		10		1.0	N	100.00	333.3
99LE0756-MB1 -S	PBLKMV		30.0	1.0	1.0	10		1.0	N	100.00	333.3

Comments: SAMPLES IN 272 & 294 WERE ALL TAKEN TO 40 ML
Surrogate: 100 UL 8080 PSUR 65370107 @ 4-10 UG/ML
Spike: 250 UL AR1254 65371004 @ 15 UG/ML

Extracts Transferred	Relinquished By	Date Time	Received By	Date Time	Reason for Transfer
			B. Coster	7/7/99	GC/revision

Thermo Nutech
W.O. No. N9-06-145-7153

Bechtel Hanford Inc.
SDG H0452

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0452 is composed of a single solid sample designated under SAF No. B99-063 with a Project Designation of: 100 H Area – Other Solid.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gamma Scan Analyses

The sample aliquot was reduced due to the sample matrix resulting in an increase in the MDA achieved for this analysis. No other problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.3 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Plutonium Analyses

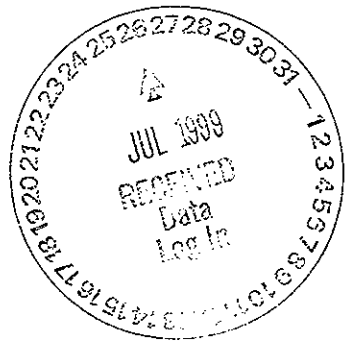
No problems were encountered during the course of the analyses.

2.5 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.6 Americium-241 Analyses

No problems were encountered during the course of the analyses.



TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

SAMPLE SUMMARY

SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B0VR10	116-H-7	SOLID		N906145-01	B99-063	B99-063-005	06/21/99 11:00
Method Blank		SOLID		N906145-03	B99-063		
Lab Control Sample		SOLID		N906145-02	B99-063		
Duplicate (N906145-01)	116-H-7	SOLID		N906145-04	B99-063		06/21/99 11:00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

QC SUMMARY

SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7153	B99-063-005	B0VR10	SOLID				06/24/99	3	N906145-01	7153-001
		Method Blank	SOLID						N906145-03	7153-003
		Lab Control Sample	SOLID						N906145-02	7153-002
		Duplicate (N906145-01)	SOLID				06/24/99	3	N906145-04	7153-004

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

PREP BATCH SUMMARY

SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Soil	6880-180	5.0	1			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	6880-180	5.0	1			1	1	1/1		
U	SOLID	Uranium, Isotopic in Soil	6880-180	5.0	1			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	6880-180	10.0	1			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	6880-180	15.0	1			1	1	1/1		
Liquid Scintillation Counting												
NI_L	SOLID	Nickel 63 in Soil	6880-180	10.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

WORK SUMMARY

SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
B0VR10			N906145-01	7153-001	AM		07/08/99	07/19/99	TAH	Americium 241 in Soil
116-H-7		SOLID	06/21/99	7153-001	GAM		07/13/99	07/19/99	TAH	Gamma Scan
B99-063-005	B99-063		06/24/99	7153-001	NI_L		07/05/99	07/19/99	TAH	Nickel 63 in Soil
				7153-001	PU		07/06/99	07/21/99	TAH	Plutonium, Isotopic in Solids
				7153-001	SR		07/07/99	07/19/99	TAH	Total Strontium in Soil
				7153-001	U		07/08/99	07/19/99	TAH	Uranium, Isotopic in Soil
Method Blank			N906145-03	7153-003	AM		07/08/99	07/19/99	TAH	Americium 241 in Soil
		SOLID		7153-003	GAM		07/13/99	07/19/99	TAH	Gamma Scan
	B99-063			7153-003	NI_L		07/06/99	07/19/99	TAH	Nickel 63 in Soil
				7153-003	PU		07/08/99	07/21/99	TAH	Plutonium, Isotopic in Solids
				7153-003	SR		07/02/99	07/19/99	TAH	Total Strontium in Soil
				7153-003	U		07/08/99	07/19/99	TAH	Uranium, Isotopic in Soil
Lab Control Sample			N906145-02	7153-002	AM		07/07/99	07/19/99	TAH	Americium 241 in Soil
		SOLID		7153-002	GAM		07/13/99	07/19/99	TAH	Gamma Scan
	B99-063			7153-002	NI_L		07/06/99	07/19/99	TAH	Nickel 63 in Soil
				7153-002	PU		07/09/99	07/21/99	TAH	Plutonium, Isotopic in Solids
				7153-002	SR		07/07/99	07/19/99	TAH	Total Strontium in Soil
				7153-002	U		07/08/99	07/19/99	TAH	Uranium, Isotopic in Soil
Duplicate (N906145-01)			N906145-04	7153-004	AM		07/09/99	07/19/99	TAH	Americium 241 in Soil
116-H-7		SOLID	06/21/99	7153-004	GAM		07/13/99	07/19/99	TAH	Gamma Scan
	B99-063		06/24/99	7153-004	NI_L		07/06/99	07/19/99	TAH	Nickel 63 in Soil
				7153-004	PU		07/08/99	07/21/99	TAH	Plutonium, Isotopic in Solids
				7153-004	SR		07/07/99	07/19/99	TAH	Total Strontium in Soil
				7153-004	U		07/08/99	07/19/99	TAH	Uranium, Isotopic in Soil

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Porm DVD-CWS
Version 3.06
Report date 07/21/99

SDG 7153
Contact L.A. Johnson

WORK SUMMARY, cont.

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-063	Americium 241 in Soil	AM/CMPLATE	1			1	1	1	4
GAM	B99-063	Gamma Scan	GAMMAHI	1			1	1	1	4
NI_L	B99-063	Nickel 63 in Soil	NI63LSC	1			1	1	1	4
PU	B99-063	Plutonium, Isotopic in Solids	PUPLATE	1			1	1	1	4
SR	B99-063	Total Strontium in Soil		1			1	1	1	4
U	B99-063	Uranium, Isotopic in Soil	UPLATE	1			1	1	1	4
TOTALS				6			6	6	6	24

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 07/21/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0452

N906145-03 Method Blank

METHOD BLANK

SDG 7153 Client/Case no Hanford SDG-H0452
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N906145-03 Client sample id Method Blank
Dept sample id 7153-003 Material/Matrix SOLID
SAF No B99-063

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.062	0.054	0.068	1.0	U	U
Uranium 235	15117-96-1	0.011	0.022	0.082	1.0	U	U
Uranium 238	U-238	0	0.018	0.068	1.0	U	U
Plutonium 238	13981-16-3	-0.007	0.014	0.054	1.0	U	PU
Plutonium 239/240	PU-239/240	0.007	0.028	0.068	1.0	U	PU
Nickel 63	13981-37-8	0.231	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.006	0.019	0.039	1.0	U	AM
Total Strontium	SR-RAD	-0.033	0.16	0.30	1.0	U	SR
Potassium 40	13966-00-2	U		0.20		U	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.010	0.10	U	GAM
Europium 152	14683-23-9	U		0.040	0.10	U	GAM
Europium 154	15585-10-1	U		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	U		0.050	0.10	U	GAM
Radium 228	15262-20-1	U		0.060	0.20	U	GAM
Thorium 228	14274-82-9	U		0.020		U	GAM
Thorium 232	TH-232	U		0.060		U	GAM
Americium 241	14596-10-2	U		0.040		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Uranium 235	15117-96-1	U		0.050		U	GAM

100 H Area - Other Solid

QC-BLANK 31152

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

N906145-02 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7153 Client/Case no Hanford SDG-H0452

Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N906145-02 Client sample id Lab Control Sample

Dept sample id 7153-002 Material/Matrix SOLID

SAF No B99-063

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	5.10	0.66	0.30	1.0		U	4.83	0.19	106	77-123	80-120
Uranium 235	3.83	0.54	0.089	1.0		U	3.92	0.16	98	77-123	80-120
Uranium 238	5.27	0.66	0.29	1.0		U	5.24	0.21	101	79-121	80-120
Plutonium 238	10.2	0.75	0.060	1.0		PU	10.0	0.40	102	85-115	80-120
Plutonium 239/240	0.048	0.030	0.028	1.0	J	PU	0.030	0.001	160	-51-251	80-120
Nickel 63	138	3.6	1.9	30		NI_L	134	5.4	103	83-117	
Americium 241	8.98	0.72	0.037	1.0		AM	9.58	0.38	94	85-115	80-120
Total Strontium	12.0	0.69	0.40	1.0		SR	11.4	0.46	105	81-119	
Cobalt 60	0.670	0.075	0.060	0.050		GAM	0.744	0.030	90	74-126	80-120
Cesium 137	0.860	0.071	0.060	0.10		GAM	0.812	0.032	106	72-128	80-120

100 H Area - Other Solid

QC-LCS 31151

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

N906145-04 B0VR10

DUPLICATE

SDG 7153 Client/Case no Hanford SDG-H0452

Contact L.A. Johnson Case no TRB-SBB-207925

DUPLICATE	ORIGINAL	
Lab sample id N906145-04	Lab sample id N906145-01	Client sample id B0VR10
Dept sample id 7153-004	Dept sample id 7153-001	Location/Matrix 116-H-7 SOLID
	Received 06/24/99	Collected 06/21/99 11:00
		Custody/SAF No B99-063-005 B99-063

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Uranium 233/234	0.054	0.046	0.059	1.0	U	U	0.078	0.047	0.060	J	36	150
Uranium 235	0.019	0.019	0.071	1.0	U	U	0	0.019	0.072	U	-	
Uranium 238	0.069	0.046	0.059	1.0	J	U	0.110	0.063	0.060	J	46	131
Plutonium 238	0.013	0.026	0.048	1.0	U	PU	0.030	0.018	0.023	J	79	221
Plutonium 239/240	0.598	0.11	0.048	1.0	J	PU	0.630	0.092	0.023	J	5	37
Nickel 63	27.2	1.9	1.9	30	J	NI_L	27.0	1.8	1.8	J	1	26
Americium 241	0.198	0.058	0.053	1.0	J	AM	0.138	0.048	0.032	J	36	68
Total Strontium	2.50	0.21	0.20	1.0		SR	2.50	0.29	0.26		0	30
Potassium 40	4.00	0.80	0.60			GAM	4.02	0.72	1.1		0	51
Cobalt 60	1.10	0.11	0.090	0.050		GAM	1.04	0.14	0.11		6	40
Cesium 137	1.90	0.14	0.20	0.10		GAM	2.06	0.21	0.20		8	37
Europium 152	34.0	0.54	0.40	0.10		GAM	34.6	0.58	0.42		2	32
Europium 154	3.20	0.36	0.30	0.10		GAM	3.42	0.43	0.36		7	41
Europium 155	U		0.30	0.10	U	GAM	U		0.27	U	-	
Radium 226	U		0.20	0.10	U	GAM	U		0.37	U	-	
Radium 228	0.390	0.35	0.50	0.20	U	GAM	U		0.64	U	-	
Thorium 228	0.160	0.096	0.10			GAM	U		0.15	U	6	175
Thorium 232	0.390	0.35	0.50		U	GAM	U		0.64	U	-	
Americium 241	U		0.40		U	GAM	U		0.18	U	-	
Uranium 238	U		20		U	GAM	U		26	U	-	
Uranium 235	U		0.40		U	GAM	U		0.39	U	-	

100 H Area - Other Solid

QC-DUP#1 31153

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/21/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0452

N906145-01 B0VR10

DATA SHEET

SDG	7153	Client/Case no	Hanford SDG-H0452
Contact	L.A. Johnson	Case no	TRB-SBB-207925
Lab sample id	N906145-01	Client sample id	B0VR10
Dept sample id	7153-001	Location/Matrix	116-H-7 SOLID
Received	06/24/99	Collected	06/21/99 11:00
		Custody/SAF No	B99-063-005 B99-063

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233/234	U-233/234	0.078	0.047	0.060	1.0	J	U
Uranium 235	15117-96-1	0	0.019	0.072	1.0	U	U
Uranium 238	U-238	0.110	0.063	0.060	1.0	J	U
Plutonium 238	13981-16-3	0.030	0.018	0.023	1.0	J	PU
Plutonium 239/240	PU-239/240	0.630	0.092	0.023	1.0	J	PU
Nickel 63	13981-37-8	27.0	1.8	1.8	30	J	NI_L
Americium 241	14596-10-2	0.138	0.048	0.032	1.0	J	AM
Total Strontium	SR-RAD	2.50	0.29	0.26	1.0		SR
Potassium 40	13966-00-2	4.02	0.72	1.1			GAM
Cobalt 60	10198-40-0	1.04	0.14	0.11	0.050		GAM
Cesium 137	10045-97-3	2.06	0.21	0.20	0.10		GAM
Europium 152	14683-23-9	34.6	0.58	0.42	0.10		GAM
Europium 154	15585-10-1	3.42	0.43	0.36	0.10		GAM
Europium 155	14391-16-3	U		0.27	0.10	U	GAM
Radium 226	13982-63-3	U		0.37	0.10	U	GAM
Radium 228	15262-20-1	U		0.64	0.20	U	GAM
Thorium 228	14274-82-9	U		0.15		U	GAM
Thorium 232	TH-232	U		0.64		U	GAM
Americium 241	14596-10-2	U		0.18		U	GAM
Uranium 238	U-238	U		26		U	GAM
Uranium 235	15117-96-1	U		0.39		U	GAM

100 H Area - Other Solid

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

METHOD SUMMARY

AMERICIUM 241 IN SOIL

ALPHA SPECTROSCOPY

Test AM Matrix SOLID
SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Americium 241
Preparation batch 6880-180					
B0VR10	N906145-01			7153-001	0.138 J
BLK (QC ID=31152)	N906145-03			7153-003	U
LCS (QC ID=31151)	N906145-02			7153-002	ok
Duplicate (N906145-01)	N906145-04			7153-004	ok J
Nominal values and limits from method				RDLs (pCi/g)	1.0
100 H Area - Other Solid					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180	2σ prep error 5.0 %	Reference Lab Notebook 6880 pg.180														
B0VR10	N906145-01			0.032	0.500			90		783			17	07/06/99	07/08	SS-008
BLK (QC ID=31152)	N906145-03			0.039	0.500			98		783				07/06/99	07/08	SS-009
LCS (QC ID=31151)	N906145-02			0.037	0.500			92		534				07/06/99	07/07	SS-056
Duplicate (N906145-01) (QC ID=31153)	N906145-04			0.053	0.500			84		900			18	07/06/99	07/09	SS-044
Nominal values and limits from method				1.0	0.500			20-105		700	100		180			

PROCEDURES	REFERENCE	AM/CMPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-960	Americium-Curium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.040 ± 0.018
YIELD 91 ± 12

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Test PU Matrix SOLID
SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Plutonium 238		Plutonium 239/240	
Preparation batch 6880-180								
B0VR10	N906145-01			7153-001	0.030	J	0.630	J
BLK (QC ID=31152)	N906145-03			7153-003	U		U	
LCS (QC ID=31151)	N906145-02			7153-002	ok		HIGH	J
Duplicate (N906145-01)	N906145-04			7153-004	ok	U	ok	J
Nominal values and limits from method				RDLs (pCi/g)	1.0		1.0	
100 H Area - Other Solid								

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180	2σ prep error 5.0 %	Reference Lab Notebook 6880 pg.180														
B0VR10	N906145-01			0.023	0.500			75		1066			15	07/03/99	07/06	SS-016
BLK (QC ID=31152)	N906145-03			0.068	0.500			42		783				07/03/99	07/08	SS-007
LCS (QC ID=31151)	N906145-02			0.060	0.500			88		732				07/03/99	07/09	SS-032
Duplicate (N906145-01) (QC ID=31153)	N906145-04			0.048	0.500			68		783			17	07/03/99	07/08	SS-010
Nominal values and limits from method				1.0	0.500			20-105		10	100		180			

PROCEDURES	REFERENCE	PUPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-940	Plutonium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.050 ± 0.039
YIELD 68 ± 39

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

Test U Matrix SOLID
SDG 7153
Contact L.A. Johnson

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Uranium 233/234	2: Uranium 235	3: Uranium 238	RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 6880-180											
B0VR10	N906145-01			7153-001	0.078 J	U	0.110 J	71	59	0	17
BLK (QC ID=31152)	N906145-03			7153-003	U	U	U				
LCS (QC ID=31151)	N906145-02			7153-002	ok	ok	ok				
Duplicate (N906145-01)	N906145-04			7153-004	ok U	- U	ok J	78	85	28	33
Nominal values and limits from method				RDLs (pCi/g)	1.0	1.0	1.0	100		4	
100 H Area - Other Solid							Averages	75		14	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180 2σ prep error 5.0 % Reference Lab Notebook 6880 pg.180																
B0VR10	N906145-01			0.072	1.00			103		150			17	07/01/99	07/08	SS-048
BLK (QC ID=31152)	N906145-03			0.082	1.00			90		150				07/01/99	07/08	SS-050
LCS (QC ID=31151)	N906145-02			0.30	1.00			83		150				07/01/99	07/08	SS-049
Duplicate (N906145-01) (QC ID=31153)	N906145-04			0.071	1.00			102		156			17	07/01/99	07/08	SS-036
Nominal values and limits from method				1.0	1.00			30-105		150	100		180			

PROCEDURES	REFERENCE	UPLATE
	EP-060	Soil Preparation, rev 0
	EP-070	Soil Dissolution, rev 0
	EP-910	Uranium Purification, rev 0
	EP-008	Heavy Elements Electroplating, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.13 ± 0.23
YIELD 94 ± 19

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL

BETA COUNTING

Test SR Matrix SOLID
SDG 7153
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Total Strontium
Preparation batch 6880-180					
B0VR10	N906145-01			7153-001	2.50
BLK (QC ID=31152)	N906145-03			7153-003	U
LCS (QC ID=31151)	N906145-02			7153-002	ok
Duplicate (N906145-01)	N906145-04			7153-004	ok
Nominal values and limits from method				RDLs (pCi/g)	1.0
100 H Area - Other Solid					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180	2σ prep error 10.0 %	Reference Lab Notebook 6880 pg.180														
B0VR10	N906145-01			0.26	1.00			68		200			16	07/02/99	07/07	GRB-219
BLK (QC ID=31152)	N906145-03			0.30	1.00			71		200				07/02/99	07/02	GRB-230
LCS (QC ID=31151)	N906145-02			0.40	1.00			82		400				07/02/99	07/07	GRB-220
Duplicate (N906145-01) (QC ID=31153)	N906145-04			0.20	1.00			81		200			16	07/02/99	07/07	GRB-232
Nominal values and limits from method				1.0	1.00					100			180			

PROCEDURES RP-500 Strontium - Initial Separation, rev 0
RP-519 Strontium-89,90 Demounting and Yttrium Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.29 ± 0.17
YIELD 76 ± 14

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

Test GAM Matrix SOLID
SDG 7153
Contact L.A. Johnson

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Cobalt 60	Cesium 137
Preparation batch 6880-180						
B0VR10	N906145-01			7153-001	1.04	2.06
BLK (QC ID=31152)	N906145-03			7153-003	U	U
LCS (QC ID=31151)	N906145-02			7153-002	ok	ok
Duplicate (N906145-01)	N906145-04			7153-004	ok	ok
Nominal values and limits from method 100 H Area - Other Solid				RDLs (pCi/g)	0.050	0.10

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180 2σ prep error 15.0 % Reference Lab Notebook 6880 pg.180																
B0VR10	N906145-01			0.69	223					399			22	07/06/99	07/13	02,01,00
BLK (QC ID=31152)	N906145-03			0.030	223					400				07/06/99	07/13	01,04,00
LCS (QC ID=31151)	N906145-02			0.060	223					400				07/06/99	07/13	01,03,00
Duplicate (N906145-01) (QC ID=31153)	N906145-04			0.40	223					432			22	07/06/99	07/13	02,03,00
Nominal values and limits from method				0.050	1010					100			180			

PROCEDURES	REFERENCE	GAMMAHI
	EP-060	Soil Preparation, rev 0
	EP-100	Ge(Li) Preparation for Environmental Samples, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.30 ± 0.62
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0452

Test NI_L Matrix SOLID
SDG 7153
Contact L.A. Johnson

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
Preparation batch 6880-180						
B0VR10	N906145-01			7153-001	27.0	J
BLK (QC ID=31152)	N906145-03			7153-003	U	
LCS (QC ID=31151)	N906145-02			7153-002	ok	
Duplicate (N906145-01)	N906145-04			7153-004	ok	J
Nominal values and limits from method				RDLs (pCi/g)	30	
100 H Area - Other Solid						

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 6880-180	2σ prep error 10.0 %	Reference Lab Notebook 6880 pg.180														
B0VR10	N906145-01			1.8	0.500			96		100			14	07/03/99	07/05	LSC-005
BLK (QC ID=31152)	N906145-03			2.0	0.500			86		100				07/03/99	07/06	LSC-005
LCS (QC ID=31151)	N906145-02			1.9	0.500			95		100				07/03/99	07/06	LSC-005
Duplicate (N906145-01) (QC ID=31153)	N906145-04			1.9	0.500			90		100			15	07/03/99	07/06	LSC-005
Nominal values and limits from method				30	0.500					10			180			

PROCEDURES	REFERENCE	NI63LSC
	EP-060	Soil Preparation, rev 0
	EP-431	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.9 ± 0.16
YIELD 92 ± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 07/21/99

SDG 7153
Contact L.A. Johnson

REPORT GUIDE

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0452

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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D A T A S H E E T

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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R E P O R T G U I D E

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L A B C O N T R O L S A M P L E

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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M E T H O D S U M M A R Y

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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SAMPLE RECEIPT CHECKLIST

SAMPLE RECEIPT

Client: Bechtel Hanford Inc Date/Time received 6-24-99 9:40

CoC No. B99-041-039, B99-063-005

Container I.D. No. _____ Requested TAT (Days) 21 P.O. Received Yes [ ] No [✓]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Cooler Temperature: _____	Packing material is:	Wet [ ]	Dry [✓]
6.	Number of samples in shipping container: 3			
7.	Number of containers per sample: 3 (Or see CoC _____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [✓] Hazard labels [ ] Rad labels [✓] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			

11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____

14. Received by M. Goldenberg Date: 6-24-99 Time: 9:40

LOGIN

TNU W.O. No. _____ Group No. _____ Client W.O. No. _____

PROGRAM MANAGER

Sample holding times exceeded? Yes [ ] No [ ]

Client Notified: Name _____ Date/time _____

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-063-005

Collector: Mike Stankovich	Company Contact: Mike Stankovich; Telephone No.: (509) 531-7620	Project Coordinator: TRENT, SJ	Price Code / Data Turnaround: 21 D
Project Designation: 100 H Area - Other Solid	Sampling Location: 116-H-7	SAF No.: B99-063	
Ice Chest No.: 1 AZ STEEL DRUM	Field Logbook No.: EL-1500	Method of Shipment: FED EX	
Shipped To: TMA/~~RECRA~~ 62299	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A	
		COA: R116 H7 2600	

POSSIBLE SAMPLE HAZARDS/REMARKS
PCB

Special Handling and/or Storage
Cool 4 degree C

Preservation	None		Cool 4 C	Cool 4C	None	None	None			
Type of Container	P	aG	aG	aG	aG	aG	G/P			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	20mL	60mL	60mL	60mL	60mL	60mL	~~250~~ 1000 mL 6-21-99			
SAMPLE ANALYSIS	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082	Isotopic Uranium {Uranium-238}; Isotopic Plutonium; Americium-241	Nickel-63; Strontium-89,90 -- Total Sr	See item (2) in Special Instructions.			

Sample No.	Matrix *	Sample Date	Sample Time										
B0VR10	Other Solid	6-21-99	1100	✓ (struck) 6-21-99	—	— 62299	—	✓	✓	✓			B0VFC6
								70 CPM 0.022 mR/h	90 CPM 0.020 mR/h	80 CPM 0.020 mR/h			

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Stankovich	Date/Time 6-21-99 1500	Received By: H/B	Date/Time
Relinquished By: REF 1-B	Date/Time 62399 800	Received By: SJOALE	Date/Time 62399 800
Relinquished By: SJOALE	Date/Time 62399 800	Received By: FED EX.	Date/Time 62399
Relinquished By: Fed Ex	Date/Time 9:40 6-24-99	Received By: TNU M. Goldenberg	Date/Time 9:40 6-24-99

SPECIAL INSTRUCTIONS
R116H7 2F00 (Lab) R116H7 2600 (Samplers)
(1) ICP Metals - 6010A (Supertrace) {Chromium, Lead}; ~~Mercury - 7471 - (CV)~~ Arsenic
(2) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}

COLLECTOR UNAVAILABLE TO SIGN COC

H/B = 3°C

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time